A GUIDE TO BUSINESS MAIL PREPARATION.

ZIP+4

HELPING YOU
HELP YOUR BUSINESS.

UNITED STATES POSTAL SERVICE
A GUIDE TO BUSINESS MAIL PREPARATION
TABLE OF CONTENTS

APPENDICES

This guide is designed to help upgrade the characteristics of letter mail so that business mailers and the Postal Service can benefit from improved service and reduced mail processing costs.

INTRODUCTION

s Postal Service is rapidly modernizing through automation programs. These
signed to increase productivity, reduce processing costs through greater
ation, and improve delivery of mail throughout the country. In order to achieve
its from automated systems, it is essential that First Class letter-size business
ateria for processing by this new high technology equipment.

w high speed Optical Character Readers (OCRs) and small Bar Code Sorters
progress at postal facilities throughout the nation. For postal customers, this
provide the following benefits:

cient and accurate mail processing
Consistency of delivery
stal operating costs, which will keep rates as low as possible for as long as

his guide is to assist business mailers in making their letter-size mail compatible
ostal processing equipment. A significant volume of business mail is already being
ormatted equipment; however, benefits accrue to both postal customers and
e when addressing characteristics of letter-size mail are improved to meet
ted in this publication.

tics of business mail are equally important, as you will observe throughout

ns contained herein are guidelines primarily designed for business volume
nce is voluntary. While compliance is highly desirable, postal customers may
existing stationery stocks until they are exhausted. Revisions can be made when
uisitions are issued.

our mail pieces meet address standards for automation, the Postal Service has
cial program to assess mail pieces, make live test analyses, and advise you of
ges that should be made in address format or design.

tmaster or Customer Service Representative for more details on automation and
e its no charge for mail piece assessment services.

1.0   PHYSICAL CHARACTERISTICS OF LETTER MAIL FOR AUTOMATION

1.1   STANDARD DIMENSIONS

1.1.1   Table 1 defines letter-size mail piece dimensions effective July 15, 1979. The minimum sizes apply to all mail except keys, identification devices, and mail pieces which are more than 1/4 inch thick. Any mail piece which does not conform to these minimum size standards is non-mailable.

The maximum sizes apply to First-Class Mail weighing one ounce or less and single piece rate Third-Class Mail weighing one ounce or less. Mail which exceeds these dimensions or falls outside of the range of acceptable ratios of length to height will be surcharged.

First-Class letter mail which exceeds the maximum sizes shown below cannot be processed on the new automated equipment and must be sorted by less efficient methods.

TABLE 1

Standard Dimensions	Minimum Size	Maximum Size
Height	3½"	6¼"
Length	5"	11½"
Thickness (uncompressed)	.007"	0.25"
Aspect Ratio (Length/Height)	Between 1.3:1 and 2.5:1	

The aspect ratio (length to height) of letter-size mail requires mail pieces to be rectangular within prescribed limits. The aspect ratio can be checked by dividing the length of a mailing piece by its height. If the result is between 1.3:1 and 2.5:1 inclusive, the piece has acceptable size aspect ratio. If not within this range, the mail piece will be considered non-standard and will be subject to the same surcharge as over-sized mail.

1.1.2   First-Class Mail weighing one ounce or less and single piece Third-Class Mail weighing one ounce or less are acceptable at the non-surcharged piece rate if their physical measurements fall between the minimum and maximum dimensions of Table 1

1.2   PREFERRED DIMENSIONS

The Standard Dimensions listed in Table 1 represent the maximum range of sizes which can be processed using postal automated equipment. As in any processing or manufacturing activity, operational efficiency is affected as tolerance limits are approached. In order to provide optimum allowance for postal automated equipment tolerances, the preferred dimensions for letter mail should conform to the range of sizes listed in Table 2. The ratio of length to height should be between 1.3 and 2.5.

TABLE 2

Preferred Dimensions	Minimum Size	Maximum Size
Height	3⅛"	5¼"
Length	5½"	10¼"
Thickness (uncompressed)	.009"	0.20"

Aspect Ratio (Length/Height) Between 1.3:1 and 2.5:1

1.3 WINDOW ENVELOPES

1.3.1 The standard dimensions set forth in Section 1.1 apply to window envelopes.

1.3.2 Envelope windows must be large enough that the address shown on the insert is entirely visible with at least ⅛ inch clearance (¼ inch is preferred) between the window and the bottom and side edges of the address even when it is moved to its full limits inside the envelope.

1.3.3 The window address must not encroach on the bar code clear zone. (See 2.5)

1.4 WINDOW ENVELOPE INSERTS

Inserts should be designed for maximum compatibility with the envelope. The dimensions of the insert should be chosen so that the entire address is visible without permitting extraneous (non-address) printing to appear in the window area. Inserts should not contain extraneous printing which, when placed in an envelope, would appear on or below the delivery address line.

If non-address data must be a part of the address block, it should appear on the line immediately above or below the name of the recipient line.

1.5 WINDOW MATERIAL

1.5.1 Envelope windows should be covered with a clear or translucent material glued securely on all edges. The window material should be free of wrinkles, streaks, excessive glare, or other conditions which obscure the address. For information on opacity, see 2.11.

1.5.2 If open windows are used, the size of the opening should be kept to a minimum and should maintain the preferred ¼ inch clearance between the window and the bottom and side edges of the address.

1.6 ENVELOPE MATERIAL AND CONSTRUCTION

1.6.1 Paper envelopes should have a minimum basis weight of 20 pounds (17" × 22", 500 sheet basis). Envelopes made from material other than paper may be submitted to the Executive Director, USPS Engineering Support Center, 11711 Parklawn Drive, Rockville, MD 20852-8101, for testing and analysis and decision on acceptability for use in mailing. At present, bar codes do not print clearly on material such as spun olefin and certain recycled paper. Envelopes made of these materials cannot be processed on postal automated equipment.

1.6.2 Glossy coated paper and other smooth paper stock which is used to manufacture envelopes and post cards are not a problem on automated processing equipment. Textured paper and paper containing dark fibers should not be used since such fibers can cause interference to optical character readers. If dark fibers are incorporated into the paper, the print reflectance difference (PRD) between the fibers and the background should not exceed 10%. Envelope paper should not have Phosphor Meter Units (PMU) greater than 3.0, as measured on the USPS Model IV-A Phosphor Meter.

1.6.3 A white background for the address block is preferred; however, other light background may be used provided the envelope reflectance is at least 50% when measured in the red portion of the spectrum centered at 650 nanometers (nm), and at least 45% when measured in the green portion of the spectrum centered at 540 nm (see Appendix K). Halftone screenings of less than 200 dots per inch, in the address area of the envelope or card, may cause OCR interference.

1.6.4 Mail pieces should be closed on all four edges. Mailers should take care during the wetting and sealing process of enveloped mail so as not to overwet the seal and cause envelopes to stick together. Letter-size mail pieces (see 1.1.1) should not be sealed with wax, clasps, string, buttons, or staples. Such protrusions often catch on the edges of other mail pieces and cause jams and damage.

1.6.5 Edges of mail pieces should not be notched or scalloped; they must be straight. Envelopes must be rectangular in shape. If not, they may be non-mailable or surcharged.

1.7 STIFFNESS

Letter-size mail must be stiff enough to allow reasonable handling. In general, if the minimum paper weight, thickness including insert, and construction guidelines stated in this document are adhered to, then the minimum stiffness requirements are also satisfied. (See 4.3.1 for post card stiffness recommendations.)

2.0 ADDRESSING FOR AUTOMATION

2.1 ADDRESS BLOCK LOCATION

The entire address should be contained within an imaginary rectangle, which is the OCR READ AREA, on the front of the mail piece, as illustrated in Appendix A, Page 20.

- **Sides of rectangle** – 1 inch from left and right edges of the mail piece
- **Bottom of rectangle** – ⅝ inch from bottom edge of the mail piece
- **Top of rectangle** – 2¾ inches from bottom edge of the mail piece

All characters on the last line of the address block (the post office, state and ZIP Code line) must be located within the OCR read area indicated above to conform to the guidelines (i.e., the top of the post office, state and ZIP Code line must be no higher than 2¾ inches from the bottom of the mail piece).

2.2 TYPOGRAPHIC TOLERANCES

Parameters	Range
1. Character pitch:	7-12 characters per inch (10 to 12 preferred)
2. Character spacing:	0.01" min., 0.05" max. See Appendix B. This is particularly important when proportionally spaced printing is used.
3. Character height:	0.08-0.20 inch. (8 to 18 point)
4. Character stroke width:	0.010" min., 0.030" max.
5. Character height/width ratio:	1.1:1 to 1.7:1
6. Space between words:	From 1 to 2 character spaces; [0.1" min.] including the space between the last character of the state name or abbreviation and the first digit of the ZIP Code. The ability of the OCR to recognize the ZIP Code as part of the address diminishes with each additional space beyond 2.
7. Line pitch:	Uniform from 4 to 8 lines per inch (6 lines are preferred).
8. Space between lines:	Minimum of 0.025 inch (0.06" preferred); maximum of 2 character heights. This is the vertical distance from the bottom most point of either an upper or lower case character to the highest point reached by the tallest character in the line below.

[Reference Appendix B]

2.3 OCR READABLE FONTS

Simple sans-serif fonts are preferred. Stroke width should be uniform throughout the character. Italic, artistic, cyrillic and script-like fonts cannot be read by the OCR. In general, matrix fonts with touching dots or matrix elements are more readable than those fonts with widely separated matrix elements. For letter mail to be OCR readable, it must have address information printed in conformance with specifications in 2.2. All upper case characters are preferred for the post office, state and ZIP Code line.

2.4 CHARACTER AND LINE SKEW (SLANT)

A variation of ±5 degrees from a line parallel to the bottom edge of the envelope may be tolerated, provided that the characters remain within the specified address area (see Appendix B).

2.5 ENVELOPE CLEAR ZONES

Within the OCR read area, the entire space on or below the delivery address line should be clear of printing other than the address itself (see Appendix A).

An area ½" in height measured from the bottom edge of the mail piece and ½" in length measured from the right hand edge should be left clear for the application of bar codes.

On Business Reply Mail and pre-barcoded courtesy reply mail a clear zone is reserved for the facing identification mark (FIM), beginning 1¾ inch from the top right edge of the mail piece and extending 1¼ inch to the left. The clear zone is ⅝ inch deep, as measured from the top edge of the mail piece. (See 3.5 and Appendix A). FIM for pre-barcoded courtesy reply mail should also be placed in this clear zone.

2.6 ADDRESS FORMATS

2.6.1 The addresses must be typewritten or machine printed to be processed on automated equipment. Punctuation is not required and may be omitted.

2.6.2 The address should be in a block format with a uniform left margin.

2.6.3 Non-address data such as: marks, boxes, accounting numbers, subscription and presort codes, advertising, logos, underscores, underlines, endorsements, attention lines, form or envelope numbers, punch holes and other non-address data, if used, should be entered above the delivery address line, and be line immediately above or below the name of the recipient line.

2.6.4 The street address or box number (left justified) should be shown on the line immediately above the post office, state and ZIP Code. Correct spelling of the address information is essential. If both a box number and a street address are used, mail will be delivered to the address immediately above the post office, state and ZIP Code line. The ZIP Code should reflect this address. See Appendix C.

2.6.5 Mail addressed to occupants of multi-unit buildings should include the number of the apartment, suite, room, or other unit immediately after the street or building address, on the same line. Where the length of the street or building address is such that it permits the placement of the apartment, room, suite, or other unit on the same line, then that number or designator should be placed on the line immediately above the street or building address.

2.6.6 The post office, state and ZIP Code should appear in that sequence on the bottom line of the address. However, if this is not possible, the ZIP Code may be placed to align with the left edge of the address block on the line immediately below the post office and state. One or two spaces should be allowed between the two-letter state abbreviation or last letter of the state name, and the ZIP Code. The standard two-letter state abbreviations should be used. ZIP + 4 codes must always be printed as 5-digit ZIP Code, a hyphen (-), and the 4-digit add-on. The space where the hyphen is present must be a full character space. ZIP + 4 codes must never be split between two lines. No other character but a hyphen can be used.

2.7 ADDRESS PREPARATION

2.7.1 The importance of good address preparation for mail cannot be over-stressed. The addressing recommendations that follow are highly recommended for use by every mailer, regardless of the specific postal processing systems used.

2.7.2 Intersection addresses such as Maple and Main should not be used unless designated as the advanced delivery address, or unless the exact delivery address is specified on the line below the intersection address.

2.7.3 When addressing mail to multi-occupancy buildings, that can be served by many carriers, specify not only the street number of the building, but also add the exact suite or room number of the addressee as described in 2.6.5.

2.7.4 When addressing mail to a post office box as opposed to a rural route box, include the prefix "P.O."

2.7.5 Avoid spelling out house numbers. (Example: Nine-One-Nine Maple Avenue) Instead, address as follows: 919 Maple Ave.

2.7.6 Examples of properly addressed civilian mail prepared for OCR processing are exhibited in Appendix C. These address formats are good for all civilian mail.

2.7.7 Examples of properly addressed military mail are exhibited in Appendix D.

2.8 INK/PAPER RELATIONSHIP

2.8.1 OCR PRINT CONTRAST RATIO

In order to achieve the print quality required for OCR reading, some special precautions are required, including adjustment, maintenance, more frequent changing of ribbons on some printing devices, and careful selection of color combinations for the mail piece printing ink. For OCR readability, the minimum print contrast ratio measured in the green (510 nanometers) and red (650 nanometers) portion of the spectrum should be 40% (0.40). See Appendices E, F and K for measurements, calculations, definitions, and instructions.

The OCR responds best where the address block is printed or typed in black ink on a white background. Color combinations may be used provided a print contrast of at least 40% is maintained, measured in accordance with Appendices E and F.

2.8.2 LUMINESCENCE

Printing inks used on envelopes should not have a fluorescent or phosphorescent level higher than that of the envelope on which they are used. This is to ensure that the effect of the ink glow does not add to the luminescent effect of coated stamps and luminescent meter indicium on letters used to face, cancel, and divert letter mail. Mailers who use postage meters with fluorescent inks must provide indicia with a reading of at least 16 Phosphor Meter Units (PMU).

2.9 PRINT QUALITY

The performance of OCR reading systems depends to a large extent on the print quality. Every effort should be made to provide "good" print quality, i.e.:

a.   The printed character should present as high a contrast as possible to the background document in the spectral range specified in 2.8.1.

b.   Smudges, fill-ins, and voids are to be avoided within any printed character because they tend to confuse the OCR. Type should be clean and sharp.

c.   Print contrast should be uniform throughout the character.

2.10 ADDRESS AREA BACKGROUND (FOR OCR PROCESSING)

2.10.1

The basic ability of paper to reflect light in the green and red portions of the spectrum is the only color quality important to OCR reading. The address reading surface, whether label, insert, or envelope paper, must have the ability to reflect sufficient light so that high contrast is achieved when combined with the print of the address data. Envelope reflectance must be at least 50% in the red (650 nm) and 45% in the green (540 nm) portions of the spectrum.

2.10.2

Black ink clearly imprinted on a light background is recommended. Clean, well inked typewriters, printers, metal plates, etc., will provide the most acceptable results. Colored inks can be used if they provide a sufficient print contrast. Reverse printing can not be processed on postal optical character reading equipment.

2.11 ENVELOPE/WINDOW OPACITY AND SHOW-THROUGH

2.11.1 Opacity

Opacity is the characteristic that makes material such as envelope paper or envelope window material impervious to the passage of light. Paper used to construct envelopes should have sufficient opacity (within the OCR read area) to screen out interaddress printing on envelope inserts and the envelope's inner walls. Materials used to construct envelope window coverings must not have a high opacity. Desired opacity values are described in Appendices E and F.

2.11.2 SHOW-THROUGH

Some inks and opaquing designs placed on the inner walls of envelopes have the property of penetrating the envelope material to considerable depth, resulting in show through. Also, some inserts used with window envelopes possess very low opacities which, in turn, allow the printing of non-address data located on the inside of the insert to show through the window. This show-through printing, combined with address printing, presents additional confusing characters to the OCR. Therefore, any extraneous printing or designs should not appear in the OCR read area or below the delivery address line.

2.12 INTERFERING PRINTING

2.12.1 BACKGROUND INTERFERENCE

Some envelope inserts (checks, for example) are printed with a background pattern that can interfere with optical character reading. Colors that appear solid to the human eye, but are printed in a halftone screen coarser than 200 dots per inch, can also be a problem. Background printing having a print contrast ratio (PCR) greater than 15%, as measured in Appendices E and F, should not appear in the OCR read area.

2.12.2 FORM INTERFERENCE

Preprinted forms, e.g. prompting words, lines, boxes, etc., can interfere with address reading and should be avoided in the OCR read area.

3.0 PREPRINTED REPLY MAIL
[BUSINESS REPLY MAIL AND COURTESY ENVELOPES]

3.1 GENERAL CHARACTERISTICS

3.1.1 Preprinted Reply Mail in the form of cards must conform to the physical dimensions set forth in Section 4.1 and 4.2. Preprinted reply envelopes must conform to the physical dimensions of letter-size mail set forth with the following exceptions.

a. Business Reply pieces must conform to the format shown in Appendix G and must also conform to the following:

- The endorsement "NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES" must be printed in the upper right corner of the face of the mail piece. The arrangement of the endorsement may vary, but it may extend no further than 1¾-inches from the right edge of the mail piece. (Reference Appendix G).

- A series of horizontal bars placed parallel to the length of the mail piece must be printed immediately below the permit indicia endorsement. The bars must be uniform size, at least 1 inch in length, and ⅛- to ⅜-inches thick, and may bleed to the right edge of the mail piece. It is recommended that the bars be no more than 1½ inches in length. The spacing between the bars must be nearly equal to the thickness of the bars. There must be at least ½ inch clearance between the column of horizontal bars and any other printed data. The bars must not extend below the top of the delivery address line to avoid OCR interference. The delivery address line is located immediately above the line containing the post office, state and ZIP CODE [See Appendix G].

- Immediately below the BUSINESS REPLY legend, the words "First-Class Mail Permit No. xxxx," must be printed in the upper left corner of the issuing post office (city and state) must be shown in capital letters.

- The "BUSINESS REPLY MAIL" legend, the words "First-Class Mail Permit No. xxxx," and the issuing post office information can be enclosed within a rectangular box for better visual impact.

- Immediately above the address, but below the "BUSINESS REPLY MAIL" legend, must appear the legend "Postage Will Be Paid by Addressee."

- The complete address including ZIP Code should appear in accordance with 2.6 and 2.7, and Appendices A and G.

- The upper left corner of the address side is available for use by the permit holder. This area is bordered on the right by the FIM area and the legend "BUSINESS REPLY MAIL" and is above the address. It may contain the return address, logos, distributor codes, "brad" marks, etc. (see Appendix G).

- If a preprinted bar code is affixed, it must appear only in the Bar Code Read Area shown in Appendix H.

b. A FIM clear area must be maintained on the address side of Business Reply Mail pieces, except those using Business Reply labels. The FIM clear area is a horizontal rectangular area measuring a minimum of ⅛ of an inch in height by 1¼ inches in length which must be located along the top edge of the mail piece and to the left of the indicia. The FIM clear area right boundary (Section 3.5) begins 1¾ inches from the right edge of the mail piece, and the left boundary a 3 inches from the right edge of the mail piece (see Appendix J).

c. For Business Reply Mail envelope window and insert design guidelines, see 1.3 and 1.4.

d. The surcharge for non-standard size Business Reply Mail which does not meet the minimum sizes is non-mailable.

3.2 PRE-BARCODED REPLY MAIL

3.2.1 The coding of Preprinted Reply Mail is one of the steps customers can take to utilize the ZIP + 4 system and maximize the benefits achievable through automation. The nine digits of the ZIP + 4 code are translated into a series of small vertical bars and half bars which are then printed on the lower right hand corner of the envelope. The bar code permits highly reliable sortation of mail through automated bar code sorters operating at a much faster rate than manual or mechanized methods.

3.2.2 The bar code is made up of a single field of 52 bars. The bars and half bars, taken in groups of five, represent each of the nine digits of the "ZIP + 4" order, plus a 10th digit "correction character." The first and last bars are frame bars and are always full bars. The Postal Service will provide each participating firm with ZIP + 4 bar code formats on photographic film for use by envelope and post card manufacturer/printers.

3.2.3 Only bar code films from an authorized USPS contractor should be used, and must not be reduced or enlarged in size. The mailer should obtain a correct bar code image from the local Customer Service Representative. Examples of acceptable and unacceptable bar code printing are illustrated in Appendix H.

3.3 BAR CODE QUALITY CONTROL

3.3.1 To gain the benefits of bar coding, the bar code is printed on preprinted reply envelopes or post cards when ordering a supply. A USPS Customer Service Representative will help by providing bar code photographic film referenced above. Technical specifications for bar code printing are contained in 3.3.2 and Appendix H.

3.3.2 BAR CODE LOCATION

3.3.2.1 The location of the bar code on the address side of the mail piece and within a clear read area which must be free of any printing other than the bar code. The clear read area extends ⅛ inch from the bottom and at least 4½ inches from the right edge of the mail piece.

3.3.2.2 Within the bar code clear read area, the left-most bar of the bar code must be located 4 inches (+0, –¼ inch) from the right edge of the mail piece. The bottom of the bar must be ¼ inch (+0, –¹⁄₁₆) from the bottom edge of the mail piece. The bar code must be completely contained in the bar code read area (see Appendix H).

3.3.3 BAR CODE DIMENSIONS

The height of the bars is the most critical parameter since all of the information content of the code is distinguished by the height of the bars, either tall (full) or short (half), which represents a "one" or "zero" to a Bar Code Reader.

3.3.3.1 HEIGHT

A full (one) bar must be 0.125 ± .010 inch in height. A half (zero) bar must be 0.050 ± .010 inch in height.

3.3.3.2 WIDTH

The widths of all bars are equal and must be 0.020 inch ± .005 inch.

3.3.3.3 SPACING (PITCH)

The horizontal spacing must be 21 ± 1 bars per inch (one pitch = .045 to .050 inch).

3.3.4 BAR CODE/BACKGROUND CONTRAST

The bar code reader responds to the difference between the reflected light from the paper and ink. A print reflectance difference (PRD) of at least 30% is required for satisfactory reading of the code. PRD is defined in Appendix E.

An exact measurement can be obtained with the use of USPS approved Print Contrast Meter (PCM IIA) or the Envelope Reflectance Meter. Measurement methods are described in Appendices E and F.

3.3.5 SKEW

The combined effects of positional and rotational skew for the bar code must be limited to a maximum rotation of the bars (as they appear on the envelope) of ± 5 degrees from a perpendicular to the bottom edge of the envelope.

3.3.6 BASELINE SHIFT

The bar code reader contains baseline tracking circuits which compensate for minor skewed patterns. If the vertical position of the bars shifts greatly, the reader tracking circuits may compensate for skew. The bottom of any bar must not be more than 0.005 inch from an imaginary baseline connecting the bottoms of the bars and which is parallel to the bottom envelope edge.

3.3.7 PRINT ANOMALIES

Ideally, the individual bars should be perfectly shaped rectangles without imperfections. It is recognized that this can only be a goal. Normal good commercial printing quality used in envelope manufacture is acceptable. However, certain anomalies which are critical to bar code reading often go unnoticed. Some of these more important anomalies are as follows.

3.3.7.1 EXTRANEOUS INK

Attached extraneous ink may form a bulge, or sometimes even bridge adjacent bars. Extraneous ink must not cause a bar to exceed its height dimensions specified in 3.3.3. Detached extraneous ink must not exceed 0.003 inch in any dimension or cause the space-to-background print reflectance difference to exceed 10%.

3.3.7.2 VOIDS

A void is defined as an area where the bar is less than 0.011 inch wide. One type of void occurs when a relatively large section of the bar is missing. Thus, sometimes on a tall bar whose top half is missing, the void causes it to have its code information changed and appears to the reader as a short bar. No void should remove more than 0.010 inch along the bar height. A second type of void is caused by insufficient ink coverage, and results in a lighter appearing bar code. These voids are, in general, much smaller than the reduction of the reader, and effectively change the bar contrast.

3.4 BAR CODE INK/PAPER REFLECTANCE GUIDELINES

The ability of the Bar Code Reader to correctly interpret the printed bars also depends on the ink used, the ink thickness, and the envelope paper selected. The most meaningful and simplest guidelines which can be offered at this time to achieve readable bar codes are as follows:

a. The ink and printing process should yield an ink film of sufficient density that the individual bars and half-bars have a reflectance of at least 30% less than that of the envelope paper in the red portion of the spectrum range of 650 nm.

b. Extraneous matter (any background pattern, envelope insert, "show-through," or printing with a print reflectance difference of more than 10%) must not appear in the bar code read area (see 2.5).

3.5 FACING IDENTIFICATION MARKS (FIM)

3.5.1 PURPOSE

FIM coding of mail serves two purposes. It provides machine detectable indicia for automatic facing and cancellation of letter mail not having luminescent stamps or meter imprint (Business Reply Mail, Penalty Mail, etc.); and it provides a means of identifying mail having a preprinted bar code.

A FIM must be printed on Business Reply letters and cards. FIM is not required on Business Reply labels or mail more than 6¼ inches high or 11½ inches long, or ¼ inch thick. FIM is not required on Courtesy Reply Mail but should be used on pre-barcoded pieces.

3.5.2 FIM TYPES

Three FIM patterns have been defined as follows (see Appendix J):

a. FIM A—to be used only on pre-bar coded courtesy reply envelopes. Mail containing FIM A requires the presence of a luminescent stamp or meter mark to be accepted in the facer/canceler; otherwise it is rejected. Appropriately equipped facer/cancelers (such as M-36s) can divert FIM A tagged mail to a special sack, thereby separating pre-barcoded mail for immediate processing on a bar code sorter.

b. FIM B—to be used on Business Reply Mail, Penalty Mail, and Franked Mail, not bearing a preprinted bar code. When scanned, FIM B does not require luminescent indicia; the FIM itself is used for facing and canceling purposes.

c. FIM C—to be used on Business Reply Mail, Penalty Mail, or Franked Mail bearing a preprinted bar code. FIM C mail handling exactly parallels FIM A processing, except that no prepaid postage is required.

3.5.3 FIM CODE QUALITY CONTROL

The Postal Service will provide FIM negatives or positives upon request. Only negatives obtained from an authorized USPS contractor may be used. Technical specifications for FIM code printing are contained in 3.5.4 through 3.5.14, and Appendix J. Permit holders are encouraged to submit samples of their new Business Reply Mail (BRM), or other preprinted reply mail, formats to the local post office for review and approval prior to printing and distribution.

3.5.4 FIM CODE LOCATION

A FIM clear zone must be maintained as shown in Appendix J, containing no printed matter other than the appropriate FIM pattern. The right boundary of this clear zone will be 1¾ inches from the right edge of the mail piece. The left boundary of the FIM clear zone must be 3 inches from the right edge of the mail piece. The top of the bars must be no lower than ⅛ inch from the top edge of the mail piece but may touch the top of the mail piece. The clear zone area is ⅝ inch deep as measured from the top edge of the piece. The right most FIM bar must be 2 inches (± ⅛ inch) from the right edge of the mail piece.

3.5.5 FIM CODE SPACING

Unlike the ZIP + 4 bar/half-bar code pattern, FIM code bars are all full bars, but height and spacing of the FIM bars remain important since the information content embedded within the FIM bar pattern is distinguished by spacing of the bars.

3.5.6 HEIGHT

Each bar must be at least ⅝ inch high (± ⅛ inch). However, if necessary, the bars may be longer to accommodate certain printing problems even if they extend out of the clear zone reserved for FIM, as long as the bars are within ⅛-inch of the top edge of the mail piece. FIM patterns supplied by the Postal Service are ⅝ inch long and are to be printed actual size only.

3.5.7 WIDTH

Each bar must be at least .031 of an inch (± .008 inch) wide. Visually examined, the bars must not deviate from the negative used to prepare the printing plate or master. The bar width must not expand so as to fill the space between the bars.

3.5.8 FIM CODE/BACKGROUND CONTRAST

Same as specified in 3.4 for bar/half-bar codes (PRD at least 30%). Measurement of the PRD must be made with a test instrument having a spectral response as shown in the red curve of Appendix K.

3.5.9 SKEW

Two types of skew may occur in the printing of the FIM pattern on mail pieces (i.e., positional and/or rotational). In positional skew, the entire pattern may be skewed with respect to the top edge of the mail piece. This may result from cutting and folding operations particularly on envelopes, or misregistration of the pattern. In rotational skew, an individual bar or bars may be skewed with respect to the edge of the mail piece. This type of skew may result from artwork inaccuracies or distortion of the plates used in certain types of printing processes. Since these detector scans bars individually, it cannot distinguish which type of skew is present. Consequently, the skew specification is related to individual bars. The combined effects of positional and rotational skew for the FIM must be limited to a maximum rotation of the bars (the skew appear on the mail piece) of ± 5 degrees from a perpendicular to the top edge of the mail piece.

3.5.10 PRINT ANOMALIES

Same as specified for bar/half-bar codes [3.3.7]. In addition, extraneous ink must not cause a bar to exceed the width limits specified in 3.5.8.

3.5.11 UNACCEPTABLE VOIDS

One type of unacceptable void is defined as any area where the FIM is less than .023 inch wide or less than 0.50 inch in height. Another type of unacceptable void is caused by insufficient ink transfer, and results in a lightly printed bar. Unacceptable voids are generally much smaller than the resolution of the FIM detector, but can effectively reduce the PRD below the specified limit of 30%.

3.5.12 FIM CODE INK/PAPER REFLECTANCE GUIDELINES

Same as specified for bar/half-bar codes in 3.4

4.0 POST CARDS

4.1 GENERAL

Post cards, postal cards, and cards used for Business Reply Mail must conform to the requirements as defined in Domestic Mail Manual 129 and 322.

4.2 PHYSICAL DIMENSIONS

All cards used for mailing must meet the minimum size restrictions for First-Class letter mail, i.e., height 3½ inches, length 5 inches, and thickness .007 of an inch. The special post card size applies to pieces up to 4¼ inches in height by 6 inches in length. Cards which exceed this size may pay the same rate as regular First-Class letter mail. The nominal surcharge rules will apply to cards exceeding 6⅛ inches × 11½ inches and falling outside the standard limits of aspect ratio defined in 1.1.1. Cards which do not meet the minimum size are non-mailable and will be returned to the sender.

4.3 PHYSICAL RECOMMENDATIONS

4.3.1 The Postal Service has conducted extensive tests of post cards and, based on the results of these tests, has concluded that the following characteristics enhance automated processing of post cards.

    a.   **Size Range**
        Height—3½ inches to 5½ inches
        Length—6 inches to 9 inches

    b.   **Basis Weight**
        At least 125 grams per square meter

    c.   **Stiffness**
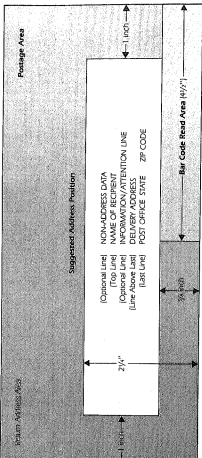   At least 500 milligrams along the length as measured in the Gurley scale.

4.3.2 Post cards should not be creased or mutilated.

4.3.3 Printing on post cards should be legible, without excessive ink, and cause no distortion to the post card. The ink should be non-abrasive, and should not transfer to feed rolls, contact rolls, or transport belts on post cards.

4.3.4 Double post cards should be spot sealed on all three of the open edges after the card is folded.

OCR READ AREA AND BAR CODE READ AREA

Postage Area

Return Address Area

Suggested Address Position

(Optional Line) NON-ADDRESS DATA
(Top Line) NAME OF RECIPIENT
(Optional Line) INFORMATION/ATTENTION LINE
(Line Above Last) DELIVERY ADDRESS
(Last Line) POST OFFICE STATE   ZIP CODE

Bar Code Read Area (4½")

1 inch

2¼"

¾ inch

5⅝ inch

Last Line of Address Must be Completely Within White OCR Area

(Not Drawn to Scale)

APPENDIX B

TYPOGRAPHIC TOLERANCES

1. **Character Pitch:**

   no less than **7 characters**
   no more than **12 characters**
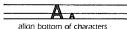   in this length
   (10 to 12 characters preferred)

   ABCDEFGHIJKL
   ABCDEFG

   |← 1" →|

2. **Character Spacing:**

   clear vertical column
   .01" min.   **AB**
   .05" max.

3. **Character Height:**

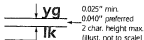   max. character ht. (.20")
   min. character ht. (.08")

   A

   align bottom of characters

4. **Character Stroke Width:**

   0.010" min.
   0.030" max.   **T**

5. **Space Between Words:**

   CITY (1 sp.) STATE (2 sp.) ZIP Code

6. **Line Pitch:**

   (keep uniform)
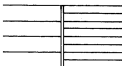
   4 lines per inch to **8 lines** per inch
   (6 lines preferred)

7. **Space Between Lines:**

   yg   0.025" min.
            0.040" preferred
   lk   2 char. height max.
            (illust. not to scale)

8. **Character Height to Width Ratio:**

   from 1.1:1 to 1.7:1

9. **Skew:**

   5°

APPENDIX C

PROPER ADDRESS FORMATS FOR CIVILIAN MAIL

(envelopes shown are not drawn to scale)

```
H E BROWN
RR 2 BOX 9
CANTON OH  44730-9521
```

```
MS LOIS SMITH
4653 GEORGIA AVE NW
WASHINGTON DC  20011-7128
```

```
MISS DOMINGA JONES
1725 E 53RD ST APT 211
CHICAGO IL  60615-4214
```

```
MR JAMES F JONES
4417 BROOKS ST NE
WASHINGTON DC  20019-4649
```

```
MR STANLEY DOE
601 FIRST ST
DETROIT MI  48226-4402
```

```
JOHN DOE CO
ROOM 1121
CAREW TOWERS
CINCINNATI OH  45202-2803
```

```
LAST NATIONAL BANK
PO BOX 345
NEW YORK NY  10163-0345
```

```
MISS JANICE SMITH
PO BOX 34
DULUTH MN  55803-0034
```

ADDRESS FORMATS FOR MILITARY MAIL

Military Mail

Overseas Military Mail

Army. Mail addressed to Army personnel must show grade; full name, including first name and middle name or initial; organization, APO number and the post office through which the mail is to be routed. Example:

```
Pvt. Willard J. Doe
Company F
167th Infantry Regt.
APO New York 09801-1087
```

Air Force. Mail addressed to Air Force personnel must show grade; full name, including first name and middle name or initial; PSC box number if served by PSC, or organization if not served by a PSC (and box number, if appropriate); APO number and the post office through which the mail is to be routed. Examples:

```
Personnel Served By PSC

A1C Howard J. Doe
PSC Box 861
APO New York 09109-2078

Personnel Served By Unit Mail Room

SSgt James T. Duncan
1838 Elecs Intsi Sq Box 137
APO San Francisco 96274-2374
```

Navy and Marine Corps. Mail Addressed to Naval and Marine personnel must show full name, including first name and middle name or initial, rank or rating, shore based organizational unit with Navy number, or mobile unit designation, or name of ship, and the fleet post office through which the mail is to be routed. Examples:

```
John M. Doe QSMN
USS Lyman K. Swenson (DD 729)
FPO San Francisco 96601-2078

Maj. John M. Doe 023492 USMCR
Staff Fleet Marine Force Pacific
FPO San Francisco 96602-2473

James T. Doe AQF-2
U.S. Naval Air Facility
FPO New York 09521-1098

Lt. Leroy A. Doe 08491 USMC
U.S. Marine Corps Air Facility
FPO San Francisco 96672-2876
```

Dependents Residing With Military Personnel. Mail sent to dependents residing in overseas areas must be addressed in care of the sponsor.

> Miss Mary J. Doe
> c/o Sgt. Howard A. Doe
> Company A, 1st Bn. 16th Inf.
> APO New York 09036-1096

Abbreviated Addresses. Those mailers addressing mail to data processing equipment may shorten the address further by abbreviating the name of the gateway post office. Example:

> APO NY 09903-1099
> APO SF 96503-2934
> APO SEA 98749-4781

Military Mail Within the United States

Army. Mail addressed to Army personnel must show grade; full name, including first name and middle name or initial; organization; military installation, state, and the ZIP Code. Example:

> Pvt. Willard J. Doe
> Co B, 1st Bn, 12th Infantry
> Fort Lewis WA 98433-6732

Air Force. Mail addressed to Air Force personnel must indicate grade; full name, including first name and middle name or initial; organization; box number (if served by a PSC); military installation; State; and either the ZIP + 4 code or the 5-digit ZIP Code. Examples:

> Personnel Served By PSC
>
> SSgt Harold R. Jones
> 377 CSW PSC Box 11567
> APO New York 09012-5438

> Personnel Served By Unit Mail Room
>
> MSgt John R. Doe
> 1838 EIS UMR Box 325
> APO San Francisco 96328-5361

Navy and Marine Corps. Mail addressed to Naval and Marine personnel must show full name including first name and middle name or initial, rank or rating, organization, military installation and the ZIP Code. Examples:

```
Bill E. Smith SK3,
U.S. Naval Supply Depot
Great Lakes IL 60088-4672

M/Sgt Peter V. Perez 1342165 USMC
Headquarters Battalion
Headquarters U.S. Marine Corps
Henderson Hall
Arlington VA 22214-3241
```

Dependents Residing With Military Personnel

a. Mail sent to dependents of military personnel for delivery through the sponsor's military unit in care of the sponsor. Example:

```
Master Robert Brown
c/o Sgt. Michael Brown
Company A. 6th Bn., 10th Inf.
Fort Gordon GA 30905-8730
```

b. Mail sent to dependents of military personnel for delivery at the sponsor's military quarters need not be addressed in care of the sponsor. Example:

```
Master Robert Brown
2519 C Street
Wright-Patterson AFB OH 45433-1284
```

INK/PAPER MEASUREMENT VALUES

This appendix addresses definitions, formulas, and measurement values for determining (1) opacity of envelope and window materials, (2) reflectance of envelope and window materials, (3) Print Reflectance Difference (PRD), and (4) Print Contrast Ratio (PCR).

Print Reflectance Difference applies to bar codes and FIM patterns, while Print Contrast Ratio applies to the alpha-numeric coding.

E.1.0 OPACITY

a. Opacity is defined in terms of R_b and R_w expressed as a percentage, where R_b equals the reflectance of the material with a standard dark backing (carbon black or black velvet used as lining for spectrophotometer cavities), and R_w equals the reflectance of the material backed with Barium Sulphate (B_2SO_4) or Magnesium Oxide (M_gO).

b. Opacity is calculated as: $(R_b/R_w) \times 100 =$ Opacity %.

c. Reflectance measurement methods are described in Appendix F.

d. Opacity of envelope window material should not exceed 25%.

E.1.1 REFLECTANCE

a. Window material paper material reflectance is defined in terms of R_w.

b. Reflectance value for envelope material should always exceed 50% in the red (650 nm) and 45% in the green (540 nm) portions of the spectrum.

c. Reflectance measurement methods are described in Appendix F.

E.1.2 PRINT REFLECTANCE DIFFERENCE (PRD)

a. PRD is defined in terms of R_p and R_w, where R_p equals the reflectance of the print and R_w equals the reflectance of the envelope material (background); expressed as a percentage.

b. $PRD = R_w - R_p$

c. PRD measurement methods are described in Appendix F.

d. PRD value for bar code and FIM should be a minimum of 30%.

E.1.3 PRINT CONTRAST RATIO (PCR)

a. PCR is also defined in terms of R_p (print reflectance) and R_w (envelope reflectance).

b. $PCR = \dfrac{R_w - R_p}{R_w}$

c. PCR measurement methods are described in Appendix F.

d. PCR value for printed addresses should be a minimum of 40% in both the green (540 nm) and red (650 nm) portions of the spectrum.

INK/PAPER MEASUREMENT METHODS

F.1.0   INSTRUMENT CALIBRATION STANDARDS

The measurement defined here addresses only diffused reflectance. A perfectly reflecting, perfectly diffusing surface has a reflectance value of 100%. All reflectance values mentioned are based on a perfectly reflecting, perfectly diffusing surface. Calibrated pressed Barium Sulphate (B_aSO_4) or Magnesium Oxide (M_gO) are suitable reference standards for instrument calibration and correspond to 100% reflectance for the white surface. Carbon black or a black backing such as black velvet used for lining spectrophotometer cavity (which should reflect less than 1% light) may be used as a suitable reference standard for transmission calibration to indicate zero percent reflectance. Instruments should be calibrated according to the manufacturer's instructions using either the above primary standards or secondary standards supplied with the measuring equipment.

F.1.1   INSTRUMENTATION

Measurements may be accommodated on the USPS approved meter, the Photographic Sciences Corporation Envelope Reflectance Meter. Where other instruments are used they must meet the special requirements for green and red-visible response.

F.1.2   AREAS OF MEASUREMENT INTEREST

   a.   For measurement of R_w and R_p associated with alphanumeric addresses (Measurement of print characters, envelope material, and envelope window material), the effective area being measured should be a circle or square 0.005 inch to 0.008 inch across.

   b.   For measurement of R_o for bars of bar code mail, the area of interest should be that produced by an aperture of 0.008 × 0.010 inch.

F.1.3   CHARACTER OF MATERIAL MEASUREMENT (ADDRESS)

   a.   Select the green spectrum (540 nm) and calibrate the instrument as described in F.1.0.

   b.   Position the character to fill the measurement area. Take several readings (at least three) at different positions on the character and use the highest instrument reading as R_p.

   c.   Position the area of envelope or window material (that area which does not contain print or interference matter, i.e. space between characters) to fill the measurement area. Take several readings (at least three) and use the lowest instrument reading as R_w.

   d.   Select the red spectrum (650 nm) and recalibrate the instrument (it should not change).

   **e.**   Repeat steps b. and c. to determine the print contrast in the red spectrum.

F.1.4 CHARACTER, EXTRANEOUS INK, OR BACKGROUND MEASUREMENTS (BAR CODE)

After instrument calibration described in F.1.0.

a. To obtain R_b for a bar, position the bar to fill measurement area, and move the bar to examine is entire vertical extent. The highest instrument reading obtained is used as R_b.

b. To obtain R_g for extraneous ink, position the bar-space to fill the measurement area, and move the bar-space to examine its entire vertical extent nominally 0.125 inch. The lowest reading obtained is used as R_g.

c. To obtain R_w, position the mail piece background, without print, to fill the measurement area. The highest instrument reading obtained with the clear area is used as R_w.

d. To obtain R_g for interfering matter in the Clear Zone, repeat step (b) above to examine all areas of significant contrast with respect to R_w. Lowest reading obtained is used as R_g.

APPENDIX G

ILLUSTRATION OF BUSINESS REPLY MAIL
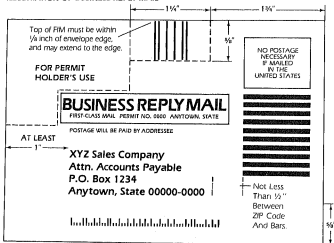
Horizontal identification bars must be at least 1 inch in length, and must not extend vertically below the delivery address line.
See Appendix H on the opposite page for detailed bar code location specifications.
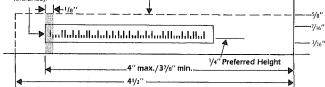See Appendix J on page 33 for detailed FIM location specifications.

BAR CODE READ AREA

Bar Code must be completely contained in this area—left most bar must be 4" maximum and 3⅝" minimum from right edge of the envelope (shaded area indicates tolerance).

Clear Zone,
Keep Free of Printing and Symbols (⅕" × 4½")

⅝"

⅞₆"

⅞₆"

¼" Preferred Height

⅛"

4" max./3⅞" min.

4½"

Not actual size — for illustration purposes only.

READING THE ZIP + 4 BAR CODE

The ZIP + 4 bar code consists of the nine digits plus a correction character used by the bar code reader to identify reading errors.

The bar code consists of 52 bars as illustrated above. Each of the 10 digits contained between the frame bits consists of 5 bars: 2 long bars (read as 1's) and 3 short bars (read as 0's).
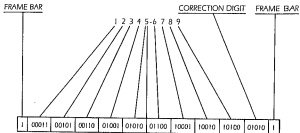
Reading and understanding the bar code is simple. There are 10 combinations of 5 bars, each consisting of 2 long (1's) and 3 short (0's) bars. The digits 0 through 9 have been assigned to these combinations.

0	11000	4	01001	8	10010
1	00011	5	01010	9	10100
2	00101	6	01100		
3	00110	7	10001		

Within the group of 5 bars, each position has a different value. From left to right, 7, 4, 2, 1, and 0. Addition of all the values in the two positions occupied by 1 bars gives the value of the combination, except in the case of 11000, which reads 11 and has been assigned as zero.

The sum of the 10 digits in the bar code must always be a multiple of 10. This determines the value of the correction character.

The sum of the nine digits of the ZIP + 4 is 45. Using a correction character of 5 makes the sum of all 10 characters 50, a multiple of 10. If the sum of the digits is not a multiple of 10, an error has been made and the bar code must not be used.
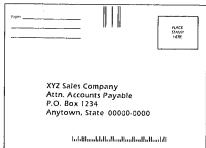

FRAME BAR   CORRECTION DIGIT   FRAME BAR

1 2 3 4 5 6 7 8 9

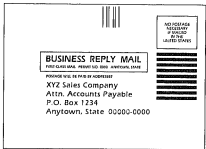| 00011 | 00101 | 00110 | 01001 | 01010 | 01100 | 10001 | 10010 | 10100 | 01010 |

FACING IDENTIFICATION MARKS

FIM A
FOR COURTESY REPLY
MAIL WITH PRE-PRINTED
BAR CODE.
ALLOWS CAPTURE AT THE
FACER CANCELER.

FIM B
FOR BUSINESS REPLY
PENALTY OR FRANKED
MAIL WITHOUT PRE-
PRINTED BAR CODE.
PREVENTS REJECTION ON
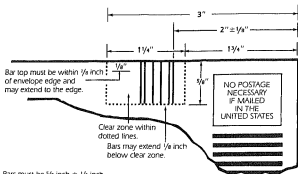THE FACER CANCELER.

FIM C
FOR BUSINESS REPLY
PENALTY OR FRANKED
MAIL WITH PRE-PRINTED
BAR CODE.
ALLOWS CAPTURE AT
FACER CANCELER.

Examples are reduced
from actual size.

3"

2" ± 1/8"

1 1/4"

1 3/4"

1/8"

Bar top must be within 1/8 inch
of envelope edge and
may extend to the edge.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

Clear zone within
dotted lines.

Bars may extend 1/8 inch
below clear zone.

5/8"

Bars must be 5/8 inch ± 1/8 inch
long. USPS supplied FIM patterns
(A-B-C) are 5/8 inch long and
should not be reduced or enlarged
in size.

30

OFFICIAL USPS SPECTRAL RESPONSE CURVES

SPECTRAL RESPONSE
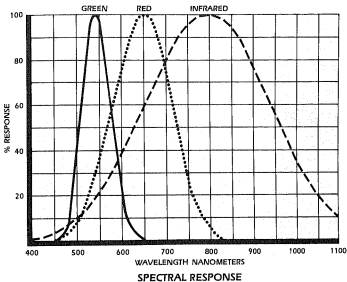
GLOSSARY

ASPECT RATIO—The relationship of length to height; e.g., 3½ inches × 5 inches (5.0/3.5 = 1.42). Aspect ratio of 1.3:1 to 2.5:1 is desirable only to improve automatic mail handling. Those mail pieces not falling within the prescribed aspect ratio of 1.3:1 to 2.5:1 will tend to tumble or jam during high speed transport thus making them less machinable. Mail outside of these limits will be surcharged.

BAR CODE—A series of printed parallel bars on a mail piece, used to facilitate automated processing.

CHARACTER LINE SKEW—Misalignment (or slant) of a printed line of characters from a horizontal line parallel to the bottom edge of the mail piece.

COURTESY REPLY MAIL—Mail generated as a result of a mailer providing a preprinted return envelope or card as a courtesy to customers which requires the customer to affix a stamp or meter imprint.

FIM PATTERN—Facing Identification Marks—A series of vertical full bars printed in the upper middle portion of the mail piece just to the left of the indicia, used to identify Business Reply Mail, and certain other bar coded mail that allows the USPS equipment to mechanically face, sort and cancel the mail.

INDICIA—Imprinted designations used on mail pieces to denote payment of postage.

LUMINESCENCE—Emission of light that is not directly attributable to incandescence, but is provided by physiological processes, by chemical action, friction, or by electrical action. Postal Facer/Canceler machines (Mark II or M36) require luminescent materials in the indicia area such as stamps, postage meter labels, etc. In order that upon detection of the luminescent-bearing mail piece by the Facer/Canceler machines, the mail piece is positioned in a prescribed fashion and a postmark cancellation imprint is made on the mail piece.

NANOMETER—A unit of wavelength (when applied to light) of 10^{-9} meters, or one billionth of a meter.

OPTICAL CHARACTER READER (OCR)—An automatic mail sorting system consisting of scanner, computer, ink jet printer and letter sorting machine. This system is capable of locating the machine-printed address written on the face of a mail piece, and reading the alpha-numeric characters to effect sorting.

OCR READ AREA—The envelope scan area in which postal optical character readers look for address information. See Appendix A.

PRINT REFLECTANCE DIFFERENCE (PRD)—Envelope reflectance minus print reflectance.

PRINT CONTRAST RATIO (PCR)—Print reflectance difference divided by the envelope reflectance, expressed as a percentage.

SMALL BAR CODE SORTER—A pure bar code reader and sorter for high speed secondary (local) bar coded mail pieces. Sorts according to the postal bar code program selected.

ZIP + 4 CODE—A nine-digit code which incorporates the original five digit ZIP Code that identifies individual post offices and stations. These five digits are followed by a hyphen and four additional digits which identify individual high volume businesses, apartment complexes, odd or even segments of street block delivery, and buildings. ZIP + 4 codes are primarily intended for use by business mailers, on a voluntary basis.